New Species of *Manettia* (Rubiaceae) from Mesoamerica

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ABSTRACT. Three new species of *Manettia* (Rubiaceae) are described from Panama: *M. arboricola*, *M. microphylla*, and *M. longicalycina*.

Manettia Mutis ex L. (Rubiaceae) is a genus of herbaceous or somewhat woody, usually twining vines distributed in the West Indies, Mexico, Central America, and South America south to subtropical Argentina and Paraguay. Comprising an estimated 80–130 species, this genus was revised by Wernham (1918, 1919) and treated for Central America and Mexico in the *North American Flora* (Standley, 1921), *Flora of Guatemala* (Standley & Williams, 1975), and *Flora of Panama* (Dwyer, 1980). Although two papers on the classification of *Manettia* were published by Chung (1967, 1968), no recent comprehensive accounts of the genus exist.

Traditionally, *Manettia* has been placed in the *Cinchoneae* (de Candolle, 1830; Schumann, 1889; Steyermark, 1974; Robbrecht, 1988), on account of its dry fruits with numerous ovules per locule and winged seeds. Because *Manettia* contains raphides, Bremekamp (1966) and Verdcourt (1958) removed it from *Cinchoneae* and placed it in *Hedyotideae*, an option also mentioned by Robbrecht (1988).

In a recent cladistic study of *Cinchoneae* incorporating cpDNA data and other information, Andersson & Persson (1991) suggested that the presence or absence of raphides in Rubiaceae is not as important a character as previously thought. Andersson and Persson placed *Manettia* in *Hedyotideae* in the same clade as *Bouvardia*, *Hedyotis*, and *Hindsia*, based on shared characters of distinct placentas attached centrally by a stipe, testal outgrowth forming a concentric wing, wood having fiber tracheids and predominantly solitary vessels, and loculicidal capsules dehiscent only at the apex.

During the course of preparing a treatment of *Manettia* for *Flora Mesoamericana*, three new species—all from Panama—came to light and are described below. Most interesting are the two hemiepiphytic species, *M. arboricola* Lorence and *M. microphylla* Lorence & Dwyer, which climb up tree trunks by means of adventitious roots, an unusual feature previously unreported in the genus. These species are otherwise characteristic of *Manettia* in terms of their flower, capsule, and seed morphology.

1. Manettia arboricola Lorence, sp. nov. TYPE: Panama. Comarca de San Blas: El Llano–Cartí Road, km 16.7, 350 m, 9°19′N, 78°55′W, 16 June 1985, *G. de Nevers & S. Charnley 5907* (holotype, MO 3623655, photo, PTBG; isotypes, F, SCZ). Figure 1.

Species non volubili hemiepiphyto habitu, radicibus adventitiis, inflorescentia terminali in ramis frondosis disposita, floribus 3–5, corolla caerulea, tubo gracili 0.5–0.6 mm in diametro distinguibilis.

Hemiepiphytic vine ascending tree trunk, the main stem woody, 1.5–2 mm diam., the bark brownish white, peeling, adventitious roots produced at nodes, the primary branches 10–23 cm long, arising at nodes, sparsely branching again, the secondary branches 4–10 cm long, 1 mm diam., usually leafy and terminated by a single inflorescence, the internodes 1–3 mm long, each side with a longitudinal ridge flanked by 2 furrows, smooth, glabrous, whitish; leaves petiolate, the petioles 2–6 × 0.5 mm, glabrous; lamina ovate, 2.5–5 × 1–2.5 cm, the base cuneate or rounded, the apex acute, glabrous, drying dark brownish green, chartaceous or membranaceous, the 2° veins 4–6 pairs, arcuate, weakly brochidodromous; stipules narrowly deltoid, 0.5 mm long, thickened. Inflorescence terminal, glabrous, cymose, 3–5-flowered, the peduncle 10–13 mm long; flowers 4-merous, the pedicels 4–10 × 0.2–0.3 mm, bracteolate, the bracteoles subulate, 1 mm long, the hypanthium obovoid-turbinate, 1.5–2 × 1–1.2 mm, glabrous; corolla blue when fresh, salverform, the tube 8–9 mm long, 0.5–0.6 mm diam., glabrous externally and internally, the lobes narrowly lanceolate-elliptic, 7–8 × 1.5–2 mm, glabrous; stamens included, affixed 2 mm below throat, the anthers 1.5 mm long, linear-ellipsoid; style 1.5 mm long, the stigma bilobed, the lobes linear, 0.5 mm

Figure 1. *Manettia arboricola* Lorence. *De Nevers & Charnley 5907* (holotype, MO).

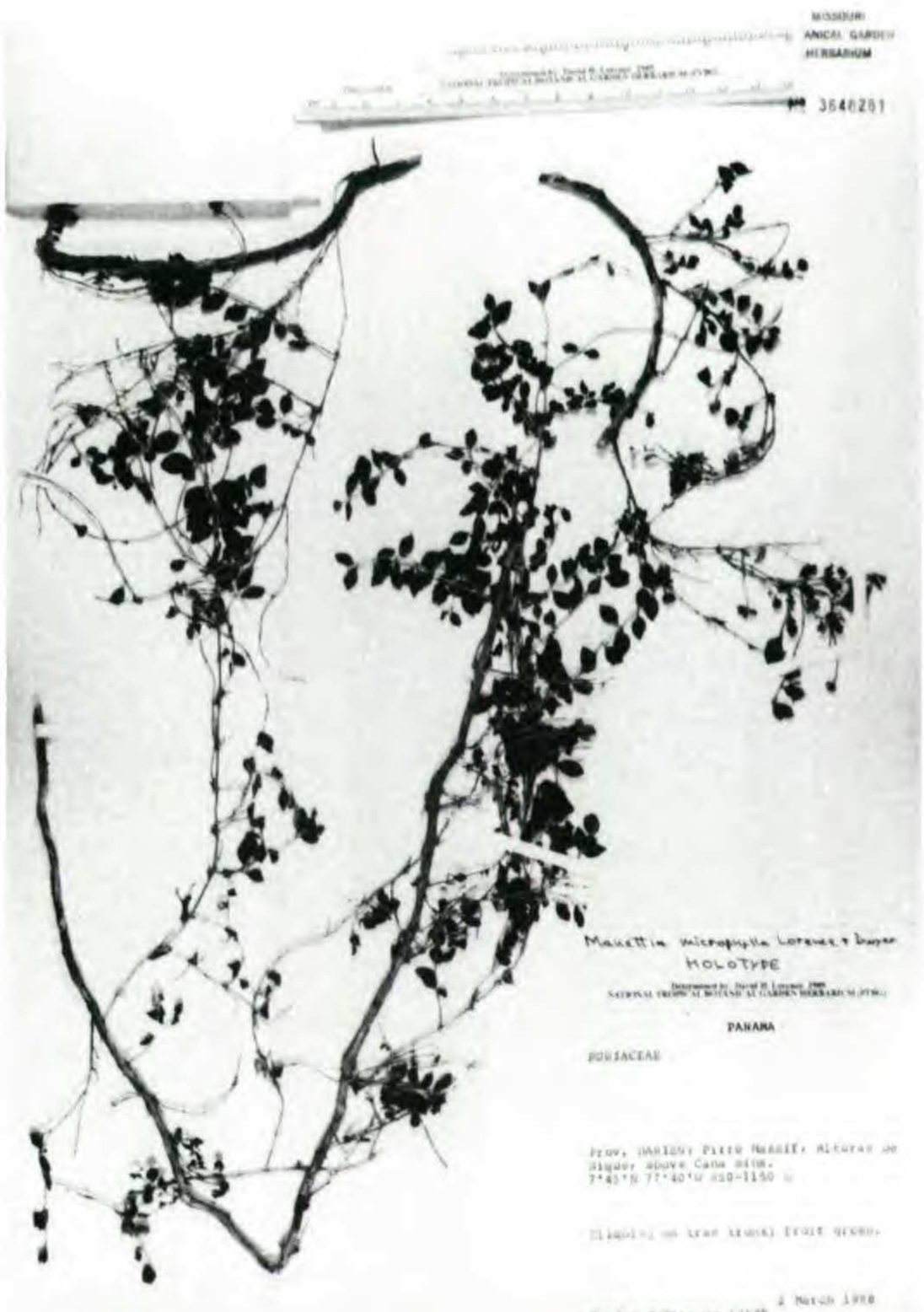

Figure 2. *Manettia microphylla* Lorence & Dwyer. *McPherson 12189* (holotype, MO).

long. Capsules obovoid-subglobose, 5–7 × 5–7 mm, weakly 8–10-ribbed, glabrous, brown; seeds 1.4–1.6 mm diam., subcircular, the center dark brown, 0.6–0.7 mm diam., the wing scarious, the testa cells radiate, elongate, the margin irregularly erose-fimbriate.

Distribution. Panama, known from the Cerro Tacarcuna in the Darién Province and from the type locality in the Comarca de San Blas.

Habitat. Manettia arboricola occurs in tropical wet forest and premontane wet forest from about 350 to 1,300 m. Flowering and fruiting specimens were collected in January, February, and June.

Manettia arboricola is most closely allied to *M. microphylla* (described below), a species with much smaller leaves and fruits and solitary flowers. Both species display the same specialized hemiepiphytic habit, are characterized by nontwining stems with adventitious roots, and have corollas that are glabrous in the throat. The blue corollas of *M. arboricola* are also unusual within the genus.

Paratypes. PANAMA. DARIEN: Cerro Tacarcuna, trail from Tacarcuna Village on Río Tacarcuna to Cerro Mali, 800–1,300 m, *A. Gentry & S. Mori 13616* (MO); trail from Río Pucuro base camp up W ridge of Cerro Mali, 640–1,000 m, *A. Gentry & S. Mori 14167* (MO).

2. Manettia microphylla Lorence & Dwyer, sp. nov. TYPE: Panama. Darién: Pirre Massif, Alturas de Nique, above Cana mine, 7°45′N, 77°40′W, 850–1,150 m, 2 Mar. 1988, *McPherson 12189* (holotype, MO 3648261, photo, PTBG; isotypes, F, PTBG). Figure 2.

Species non volubili hemiepiphyto habitu, radicibus adventitiis, foliis microphyllis, lamina elliptica vel ovato-elliptica, 5–10 mm longa, 3–5.5 mm lata, petiolis 1–2 mm longis, capsulis parvis solitariis terminalibusque distinguibilis.

Hemiepiphytic vine ascending tree trunk, the main stem woody, 3–4 mm diam., the bark brownish white, peeling, adventitious roots produced at nodes, the primary branches produced irregularly from nodes, (5–)10–40 cm long, 0.5–1 mm diam., sparsely to profusely branched again, the secondary branches 2–8 cm long, usually leafy and terminated by a single fruit, the internodes 4–7 mm long, whitish, each side with a longitudinal ridge flanked by 2 furrows, moderately hirtellous, the hairs 0.1–0.2 mm long, white, antrorse, unicellular; leaves appearing distichous (actually decussate), petiolate; petioles 1–2 × 0.2 mm, sparsely hirtellous; lamina elliptic or ovate-elliptic, 6–10 × 3–5.5 mm, the

base cuneate or rarely attenuate, the apex acute or rounded, drying dark greenish or blackish brown (in alcohol-treated specimens), chartaceous, adaxially glabrous, abaxially strigillose along costa and with numerous prominent white raphides oriented parallel to veins, the 2° veins 3(–4) pairs, arcuate, weakly brochidodromous; stipules narrowly deltoid, 0.2–0.3 mm long, glabrous, compressed, the tip thickened. Mature flowers unknown; immature flower in bud on pedicel 0.3 mm long, the hypanthium obovoid, 1 × 0.7 mm, compressed, glabrous, the calyx cup 0.15 mm deep, the lobes 4, narrowly deltoid or subulate, 0.8–1.1 × 0.2–0.3 mm; immature corolla in bud ca. 1 mm long, glabrous externally and internally. Fruits solitary, terminal, pedicellate, the pedicel 2–4 mm long, slender, bracteolate, the bracteoles narrowly subulate, ca. 1 mm long; capsule subglobose, 3–5 × 3–5 mm, slightly bisulcate, slightly compressed, weakly 6-ribbed, crowned by a low, bilobed disc, and 4 narrowly deltoid or subulate calyx lobes 1.2–1.5 × 0.4–0.5 mm, glabrous, raphides conspicuous; seeds subcircular, 1–1.3 mm diam., the center dark brown, 0.4–0.5 mm diam., the wing light brown, the testa cells long, radiating, the margin irregularly erose-fimbriate.

Distribution. Known only from the type locality, approximately 14–15 km north of the Alturas de Nique on the Panamanian–Colombian border.

Habitat. Tropical wet forest, at 850–1,150 m altitude. The type collection was fruiting in March.

Manettia microphylla is undoubtedly most closely related to *M. arboricola*, as both species share the nontwining, hemiepiphytic habit, have adventitious roots, similar stipule and seed morphology, terminal inflorescences on leafy shoots, and internally glabrous corollas. The latter species differs in having much larger leaves (25–50 × 10–25 mm), larger fruits 5–7 mm long and wide, and 3–5-flowered cymes. *Manettia microphylla* represents an extremely reduced and specialized species adapted to hemiepiphytism, growing closely appressed to tree trunks.

Figure 3. *Manettia longicalycina* Dwyer & Lorence. *Folsom & Jaslon 2665* (holotype, MO).

3. Manettia longicalycina Dwyer & Lorence, sp. nov. TYPE: Panama. Coclé: Alto Calvario, cloud forest, 800–900 m, 20 Apr. 1977, *J. P. Folsom & A. Jaslon 2665* (holotype, MO 3608777, photo, PTBG). Figure 3.

Species *Manettiae reclinatae* L. affinis, floribus in pedicellis brevibus (1–)3–5 mm longis, calycis lobis longioribus lineari-lanceolatis vel lineari-subulatis, 5–12 mm longis, corolla alba vel rosea differt.

Dextrorsely twining herbaceous vine, the young stems quadrangular, the mature stems cylindrical, 2–3 mm diam., with 4 low wings 0.2–0.3 mm wide, densely retrorsely hirtellous especially on wings. Leaves petiolate; petioles 2–10(–17) × 0.5–1 mm, sparsely villosulous or strigillose; lamina ovate or ovate-elliptic, (1.5–)2.5–9.5 × (1–)2–6 cm, the base rounded or obtuse, the apex acuminate, the acumen (2–)5–15 mm long, chartaceous or subcoriaceous, drying green or blackish green, the 2° veins 4–5 pairs, arcuate, the venation visible to 2° or 3° on both surfaces; stipules broadly obtuse or semicircular, 0.5–1 × 3–4 mm, spreading or reflexed, glabrous, the margins bearing a fringe of thick, conical, pale brown colleters 0.3 mm long. Flowers axillary, solitary or in cymes of 2–5, or in axillary leafy inflorescences 2–2.5 cm long, the pedicels and peduncles with a pair of subulate bracetoles 2–3 mm long, the peduncle 1–2 mm long; flowers on pedicels (1–)3–5 mm long, 0.5 mm diam., strigillose-hirtellous, the hypanthium obconical, 2–3 × 2 mm, compressed, hirtellous, the calyx cup 0.5–0.6 mm deep, the lobes 8 or occasionally 6, linear-lanceolate to linear-subulate, 5–9(–12) × 0.5–1 mm, strigillose-hirtellous or glabrate, erect-spreading, each sinus with 3–4 small, brown colleters; corolla white or pink when fresh, salverform, the tube 11–16 mm long, 2–2.5 mm wide medially,

externally sparsely hirtellous, internally with a white villous ring just above middle or glabrous, the throat barbate with villous yellow trichomes, the lobes elliptic, 4–7 × 2–2.5 mm, the apex acute, usually spreading 45°, occasionally with hirtellous or fringed margins; stamens affixed 1–2 mm (thrum) or 6–7 mm (pin) below throat, anthers linear, 2.5–3 mm long, included in tube or tips exserted; style glabrous, 6–9 mm (thrum) or 13 mm (pin) long. Capsules broadly obovoid or obcordiform, strongly compressed, bisulcate, 5–7 mm long and wide, glabrate or hirtellous, venose, the pedicels 5–7 mm long; seeds subcircular, 2–3 mm diam., the dark brown center 1 mm diam., the wing 0.6–1 mm wide, brown, the testa cells radiate, elongate, the margin erose-laciniate.

Distribution. Manettia longicalycina is known only from Panama, where it has been collected on the Atlantic slope in the Provinces of Coclé (Alto Calvario, La Mesa, El Valle Mesa, El Copé, and between Cerro Pilón and El Valle de Antón), Panamá (Cerro Campana, and between Cerro Azul and Cerro Jefe), and Veraguas (Escuela Agrícola Alto Piedra).

Habitat. This new species occurs in tropical wet forest and cloud forest from about 700 to 1,300 m elevation, where it grows in disturbed sites or clearings. Flowering specimens were collected in April–July, September, and October, and fruiting specimens in January, April–October, and December.

Manettia longicalycina appears to be most closely allied to *M. reclinata* L., from which it differs by the characters given in the diagnosis. This new species is also closely related to an undescribed species from Costa Rica (C. M. Taylor, pers. comm.) characterized by its much longer peduncles 10–25 mm long and pedicels 10–25 mm long, (6–)8-merous flowers, and corollas with a shorter tube 6–10 mm long and lobes 3–4 mm long. *Manettia longicalycina* typically has white or less frequently pink corollas. However, a single collection from the Canal Zone [Fort Sherman Site, U.S. Army Tropic Test Center, *J. D. Dwyer 8595*, MO] was said to have dull purple-red flowers. In addition to the anomalous flower color, this collection occurs in the wrong climatic zone and at an atypically low altitude for the species, a little above sea level. Its taxonomic status is therefore doubtful.

Paratypes. PANAMA. COCLE: between Cerro Pilón and El Valle de Antón, 700–900 m, *J. A. Duke & J. D. Dwyer* (MO); La Mesa, 2 km W of Cerro Pilón, 900 m, *G. A. Sullivan 509* (MO, US); 7 km N of El Copé, near Rivera sawmill, 700–850 m, *J. P. Folsom 5230* (MO); 2.2 km beyond sawmill in forest along lumber road above El Copé, 900 m, *B. Hammel 992* (MO); El Copé on Pacific side, ½-hour walk from sawmill, 2,600 ft., *T. Antonio 2060* (MO); above El Potroso sawmill at Continental Divide, N of El Copé, *K. Sytsma & L. Andersson 4567* (MO); sawmill above El Copé, along stream E of sawmill, 2,300 ft., *B. Hammel 4080* (MO); above sawmill above El Copé, 1,000 m, *J. S. Miller et al. 824A* (MO); 7 km N of El Copé, Alto Calvario, 700–850 m, *J. P. Folsom et al. 5732* (MO); El Valle Mesa, 5.6 km along Mesa road from main road in El Valle, 700–800 m, *J. P. Folsom 3891.Z* (MO); La Mesa, above El Valle de Antón, ca. 2 km W of Cerro Pilón, 900–930 m, *T. B. Croat 37483* (MO). PANAMA: Cerro Campana, *R. L. Dressler 3524* (MO), 780–875 m, *T. B. Croat 25190* (MO), 2,600–2,800 ft., *J. D. Dwyer 1922* (MO), 850 m, *J. S. Miller et al. 769* (MO); between Cerro Azul and Cerro Jefe, *R. L. Dressler 3248* (MO). VERAGUAS: 0.2 mi. beyond fork in road at Escuela Agrícola Alto Piedra on road to Río Calovébora, 750 m, *T. B. Croat & J. P. Folsom 33899* (MO).

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